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# A pilot study of quality of life in German prehospital emergency care physicians

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**Background:** Quality of life in patients represents an important area of assessment. However, attention to health professionals should be equally important. The literature on the quality of life (QOL) of emergency physicians is scarce. This pilot study investigated QOL in emergency physicians in Germany. **Materials and Methods:** We conducted a cross-sectional study from January to June in 2015. We approached the German Association of Emergency Medicine Physicians and two of the largest recruitment agencies for emergency physicians in Germany and invited their members to participate. We used the WHO Q-BREF to obtain QOL scores in four domains that included physical, mental, social, and environmental health. **Results:** The 478 German emergency physicians included in the study held board certifications in general medicine ( $n = 40$ ; 8.4%), anesthesiology ( $n = 243$ ; 50.8%), surgery ( $n = 63$ ; 13.2%), internal medicine ( $n = 81$ ; 17.0%), or others ( $n = 51$ ; 10.7%). The women surveyed tended to report a better QOL but worse general health than the men. Regarding specific domains, women scored worse in physical health, particularly energy during everyday work (relative risk ratio [RRR]: 1.98 [1.21–3.24]). Both men and women scored worse in psychological health than general health, particularly young women. Women were also more likely to view their safety (RRR: 1.87 [1.07–3.28]) and living place (RRR: 2.51 [1.10–5.73]) as being poor than their male counterparts. **Conclusion:** QOL in German prehospital emergency care physicians is satisfactory for the included participants; however, there were some negative effects in the psychological health domain. This is particularly obvious in young female emergency physicians.

**Key words:** Clinician, emergency care, mental health, quality of life

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## INTRODUCTION

Although emergency medicine physicians have reported high job satisfaction in previous studies, their work has gradually shown significant psychological demands due to difficult work conditions in the emergency care setting, a lack of the needed resources, poor support, and sleep deprivation.<sup>[1-4]</sup> These factors tend to induce mood decrement, irritability, and health challenges that could alter quality of life (QOL).<sup>[5]</sup> In particular, emergency physicians also feel pain after work stress;

female emergency physicians potentially face worse QOL perceptions than their male counterparts.<sup>[6,7]</sup>

Overall, QOL in emergency physicians is an understudied topic, and literature on the topic is scarce. Researchers usually focus on patients because they are demonstrably ill when presenting to hospitals or emergency medical service. It is then assumed that emergency physicians are healthy professionals who treat sick patients. However, these professional scan suffer fatigue over time due to the intensity of their professions as emergency care providers, which they are expected to fulfill on a daily basis.<sup>[8]</sup> In light of this context and on previous

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studies that recommended QOL studies in emergency care providers, we performed a pilot study to investigate QOL in prehospital emergency care physicians (PECPs) in Germany.<sup>[9]</sup>

## MATERIALS AND METHODS

### Compliance with ethical standards

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee of the Ruhr University Bochum and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

### Study sample

In Germany, emergency medicine is a subspecialty with the majority of physicians being at least in their 3<sup>rd</sup> year of training or holding a board certification in anesthesiology, surgery, general, or internal medicine. To recruit emergency physicians in this cross-sectional study, we approached the German Association of Emergency Medicine Physicians to have them send invitations to all members for participation between January and June in 2015. The two largest recruitment agencies for PECPs in Germany were also approached to invite their members to participate. Although the response rate was not 100% due to the heavy workload of emergency physicians' in nature, those who were willing and available to participate during the study time have answered all questions.

### Instrument

QOL was assessed using the WHOQOL-BREF, which was developed by the WHOQOL group with 15 international field centers to develop a QOL assessment that is cross-culturally applicable (details accessible at [http://www.who.int/mental\\_health/media/en/76.pdf](http://www.who.int/mental_health/media/en/76.pdf)). The original trial version contained 100 items using 4 items for each of 24 facets of QOL and 4 items related to the "overall quality of life and general health" facet. These facets were originally grouped into six domains but were recently combined into four final domains, namely physical, psychological, social and environmental. Due to its length, which may prevent its use in practical settings, the assessment was further modified into a short form with only 26 items.<sup>[10]</sup> In other words, 1 item for each of 24 facets of QOL and 2 items relating to the "overall quality of life and general health" facet were adopted in the short form. Its psychometric properties were also analyzed using cross-sectional data obtained from a survey of adults carried out in 23 countries ( $n = 11,830$ ). Sick and healthy respondents were sampled from the general population, as well as from hospital, rehabilitation, and primary care settings that served patients with physical and mental disorders. The sampling was performed with respect to quotas for important sociodemographic variables.<sup>[11]</sup>

Internal consistency, item-total correlations, discriminant validity, and construct validity were all validated to reflect four domains of QOL. The English version questionnaire can be viewed online for free (details at [http://www.who.int/substance\\_abuse/research\\_tools/en/english\\_whoqol.pdf](http://www.who.int/substance_abuse/research_tools/en/english_whoqol.pdf)). The short form with 26 items was previously validated in the German general population and is now available as web-based test tool.<sup>[12]</sup>

### Statistical analysis

The data were anonymized, and QOL by scores were computed for various domains. In addition to descriptive statistics and Chi-square tests, associations were estimated to produce relative risk ratios or betas ( $b$ ) together with 95% confidence intervals using multinomial logistics regression or general linear regression, depending on the outcome variables being categorical or continuous, with  $P < 0.05$  was considered statistically significant to examine the effects of participant characteristics on QOL. The statistical software MedCalc version 16.6.1 (MedCalc, Mariakerke, Belgium) and STATA version 13.0 (STATA, College Station, Texas, USA) were used to perform the analyses.

## RESULTS

The 478 German PECPs included in the study held a board certification in general medicine ( $n = 40$ ; 8.4%), anesthesiology ( $n = 243$ ; 50.8%), surgery ( $n = 63$ ; 13.2%), internal medicine ( $n = 81$ ; 17.0%), or other fields ( $n = 51$ ; 10.7%). Table 1 describes the characteristics of the participating PECPs and the mean QOL score in four domains.

**Table 1: Characteristics of German emergency physicians ( $n=478$ )**

	<i>n (%) or mean±SD</i>
Sex	
Male	361 (75.5)
Female	117 (24.5)
Age (range: 29-70 [years])	42.5±8.7
29-39	222 (46.4)
40-59	228 (47.7)
60-70	28 (5.9)
Speciality	
General medicine	40 (8.4)
Anesthesiology	243 (50.8)
Other	51 (10.7)
Surgery	63 (13.2)
Internal medicine	81 (17.0)
Quality of life scale (raw score)	
Physical domain (range: 13-35)	29.0±3.8
Psychological domain (range: 10-30)	23.3±3.5
Social domain (range: 3-15)	11.1±2.5
Environmental domain (range: 21-40)	33.0±3.6
Answering time (range: 1.6-38.6 min)	3.8±2.4
SD=Standard deviation	

The QOL item-level responses by participant sex are listed in Table 2, and the aggregated domain scores are presented in Table 3. Compared with men, women tended to perceive their overall QOL to be better but their general health to be worse. However, this trend did not reach statistical significance. In specific domains, women scored worse in physical health, in particular in energy for everyday work. Women also scored slightly worse in psychological health, although both men and women had worse scores in this domain compared with the physical health domain. In terms of the environmental domain, women tended to view their safety and living place more poorly than their male counterparts. Following further analysis, we found that young women tended to report a substantially lower psychological wellbeing, whereas older women did not appear to differ substantially from men. In the subsequent analysis, although QOL domain scores differed somewhat, across specialties among the participating PECPs (physical and psychological domain shown in Figure 1), these results did not reach statistical significance. Answering time was not significantly correlated with scores; however, the time spent on psychological health was slightly longer than that for other domains (data not shown).

## DISCUSSION

### Relevant research synthesis

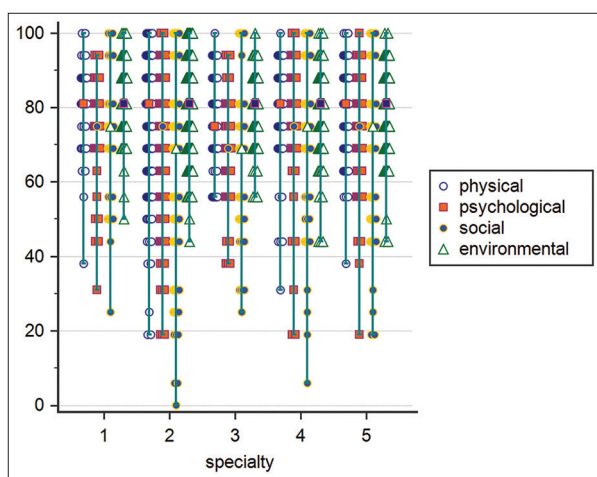
As previously mentioned, studies on QOL in emergency physicians are limited. Therefore, it is difficult to compare these findings with the existing literature. In Brazil, a Short-Form Health Survey Questionnaire (SF-36) showed that emergency physicians had worse scores in the pain domain (an aspect of psychological health).<sup>[6,13]</sup> Such mental burdens and compassion fatigue were similar across physician specialties (including surgical and medical) in the USA and were found to lead to traumatic stress.<sup>[14]</sup> A recent

pilot study from Canada examining the quality of work life (QWL) showed that emergency department physician in rural emergency departments have an average QWL with lower QWL in the subscales “support offered to employees” and working conditions reflected in the subscale “human and material resources.”<sup>[15]</sup> It was concluded that these domains possibly constitute psychosocial risk factors, which suggests the need for interventions. Although it is difficult to compare our results with the latter study because of different inventories used, it seems evident that PECPs suffer from psychological stress. Both men and women scored worse in psychological health than general health which should be further studied as this might show a need for intervention by the appropriate health authorities and employers.

A recent systematic review revealed that improving work conditions, such as changing working hours for resident physicians, could substantially improve their QOL.<sup>[16]</sup> In Spain, researchers also observed that women had a significantly worse perception than a reference population in four dimensions of the QOL SF-36, especially in regard to mental health and social functioning.<sup>[7]</sup> Moreover, motor vehicle incidents have remained common as a safety concern for resident physicians due to fatigue and sleep deprivation.<sup>[17]</sup> These studies have consistently called for attention to both resident and emergency physicians because they tend to have prolonged working hours that could deteriorate their health and consequently impact their clinical performance if left unchecked.<sup>[17-19]</sup>

### Strengths and limitations

The present study has a few strengths. First, it is the first pilot study to assess QOL in PECPs in Germany. Second, in addition to the recruitment from the German Association of Emergency Medicine, other recruitment agencies that included PECPs in Germany were approached. However, a few limitations cannot be ignored. First, the response rate cannot be assessed because it is not clear how many PECPs are in Germany compared with how many received the invitation to participate. Next, physicians in general and emergency physicians, in particular, are usually very busy and have a heavy workload. These professionals prioritize their role in saving lives. Therefore, the results observed here may not reflect the overall situation due to a potentially selective sample, which possibly over or underestimated the effects. Second, we only investigated the QOL in PECPs using a pilot study. With the current design, it was not possible to include a range of other factors (beyond sex, specialty, and age) that could modulate QOL scores. Future longitudinal studies that keep the strengths and overcome the limitations mentioned above are warranted.



**Figure 1:** Distribution of quality of life scores by specialty (1 = general medicine, 2 = anesthesiology, 3 = other, 4 = surgery, 5 = internal medicine) among German emergency physicians

**Table 2: Quality of life questions by sex among German emergency physicians**

	Male (%)	Female (%)	RRR (95% CI)*	P
How would you rate your quality of life?				
Good	292 (80.9)	97 (82.9)	1.00	
Fair	59 (16.3)	18 (15.4)	0.92 (0.52-1.64)	0.781
Poor	10 (2.8)	2 (1.7)	0.57 (0.12-2.68)	0.479
How satisfied are you with your health?				
Satisfied	270 (74.8)	82 (70.1)	1.00	
Fair	48 (13.3)	14 (12.0)	0.98 (0.51-1.87)	0.946
Dissatisfied	43 (11.9)	21 (18.0)	1.61 (0.90-2.88)	0.106
Physical domain				
To what extent do you feel that physical pain prevents you from doing what you need to do?				
Little or none	321 (88.9)	100 (85.5)	1.00	
Moderate	27 (7.5)	11 (9.4)	1.31 (0.63-2.74)	0.471
Very much	13 (3.6)	6 (5.1)	1.50 (0.55-4.05)	0.427
How much do you need any medical treatment to function in your daily life?				
Little or none	339 (93.9)	107 (91.5)	1.00	
Moderate	14 (3.9)	5 (4.3)	1.09 (0.38-3.14)	0.870
Very much	8 (2.2)	5 (4.3)	2.08 (0.66-6.55)	0.209
Do you have enough energy for everyday life?				
Mostly	275 (76.2)	74 (63.3)	1.00	
Moderate	65 (18.0)	34 (29.1)	1.98 (1.21-3.24)	0.006
Little or none	21 (5.8)	9 (7.7)	1.60 (0.70-3.66)	0.263
How well are you able to get around?				
Good	342 (94.7)	111 (94.9)	1.00	
Fair	16 (4.4)	5 (4.3)	1.03 (0.36-2.90)	0.960
Poor	3 (0.8)	1 (0.9)	1.15-(0.12-11.49)	0.903
How satisfied are you with your sleep?				
Satisfied	216 (59.8)	63 (53.9)	1.00	
Fair	62 (17.2)	27 (23.1)	1.50 (0.88-2.56)	0.134
Dissatisfied	83 (23.0)	27 (23.1)	1.13 (0.67-1.89)	0.654
How satisfied are you with your ability to perform your daily living activities?				
Satisfied	257 (71.2)	77 (65.8)	1.00	
Fair	60 (16.6)	27 (23.1)	1.51 (0.89-2.54)	0.124
Dissatisfied	44 (12.2)	13 (11.1)	0.98 (0.50-1.93)	0.965
How satisfied are you with your capacity for work?				
Satisfied	323 (89.5)	100 (85.5)	1.00	
Fair	29 (8.0)	11 (9.4)	1.26 (0.61-2.62)	0.537
Dissatisfied	9 (2.5)	6 (5.1)	2.25 (0.78-6.50)	0.135
Psychological domain				
How much do you enjoy life?				
Very much	245 (67.9)	83 (70.9)	1.00	
Moderate	96 (26.6)	26 (22.2)	0.80 (0.48-1.31)	0.370
Little or none	20 (5.5)	8 (6.8)	1.19 (0.50-2.81)	0.690
To what extent do you feel your life to be meaningful?				
Very much	308 (85.3)	100 (85.5)	1.00	
Moderate	41 (11.4)	14 (12.0)	1.09 (0.57-2.08)	0.805
Little or none	12 (3.3)	3 (2.6)	0.76 (0.21-2.74)	0.669
How well are you able to concentrate?				
Very much	271 (75.1)	85 (72.7)	1.00	
Moderate	82 (22.7)	27 (23.1)	1.07 (0.65-1.76)	0.793
Little or none	8 (2.2)	5 (4.3)	2.04 (0.65-6.42)	0.222

Contd...



**Table 2: Contd...**

	Male (%)	Female (%)	RRR (95% CI)*	P
Are you able to accept your bodily appearance?				
Very much	280 (77.6)	76 (65.0)	1.00	
Moderate	71 (19.7)	28 (23.9)	0.92 (0.52-1.64)	0.781
Little or none	10 (2.8)	13 (11.1)	0.57 (0.12-2.68)	0.479
How satisfied are you with yourself?				
Satisfied	283 (78.4)	82 (70.1)	1.00	
Fair	55 (15.2)	20 (17.1)	1.25 (0.71-2.22)	0.436
Dissatisfied	23 (6.4)	15 (12.8)	2.26 (1.12-4.53)	0.022
How often do you have negative feelings such as blue mood, despair, anxiety, depression?				
Seldom	237 (65.7)	65 (55.6)	1.00	
Often	82 (22.7)	35 (29.9)	1.58 (0.97-2.56)	0.065
Very often	42 (11.6)	17 (14.5)	1.49 (0.80-2.80)	0.213
Social domain				
How satisfied are you with your personal relationships?				
Satisfied	261 (72.3)	82 (70.1)	1.00	
Fair	54 (15.0)	17 (14.5)	1.01 (0.56-1.85)	0.965
Dissatisfied	46 (12.7)	18 (15.4)	1.24 (0.68-2.26)	0.483
How satisfied are you with your sex life?				
Satisfied	187 (51.8)	63 (53.9)	1.00	
Fair	74 (20.5)	22 (18.8)	0.90 (0.51-1.56)	0.697
Dissatisfied	100 (27.7)	32 (27.4)	0.95 (0.58-1.56)	0.846
How satisfied are you with the support you get from your friends?				
Satisfied	238 (65.9)	89 (76.1)	1.00	
Fair	95 (26.3)	21 (18.0)	0.59 (0.35-1.01)	0.054
Dissatisfied	28 (7.8)	7 (6.0)	0.67 (0.28-1.59)	0.365
Environmental domain				
How safe do you feel in your daily life?				
Very much	310 (85.9)	93 (79.5)	1.00	
Moderate	41 (11.4)	23 (19.7)	1.87 (1.07-3.28)	0.029
Little or none	10 (2.8)	1 (0.9)	0.34 (0.04-2.67)	0.303
How healthy is your physical environment?				
Very much	305 (84.5)	98 (83.8)	1.00	
Moderate	49 (13.6)	15 (12.8)	0.94 (0.50-1.76)	0.849
Little or none	7 (1.9)	4 (3.4)	1.75 (0.49-6.21)	0.385
Have you enough money to meet your needs?				
Mostly	294 (81.4)	98 (83.8)	1.00	
Moderate	48 (13.3)	15 (12.8)	0.94 (0.50-1.76)	0.845
Little or none	19 (5.3)	4 (3.4)	0.63 (0.21-1.89)	0.405
How available to you is the information that you need in your day-to-day life?				
Mostly	351 (97.2)	112 (95.7)	1.00	
Moderate	8 (2.2)	5 (4.3)	1.87 (0.60-5.88)	0.282
Little or none	2 (0.6)	0 (0)	N/A	N/A
To what extent do you have the opportunity for leisure activities?				
Mostly	138 (38.2)	57 (48.7)	1.00	
Moderate	125 (34.6)	31 (26.5)	0.61 (0.37-1.01)	0.053
Little or none	98 (27.2)	29 (24.8)	0.72 (0.43-1.21)	0.216
How satisfied are you with the conditions of your living place?				
Satisfied	310 (85.9)	97 (82.9)	1.00	
Fair	37 (10.3)	9 (7.7)	0.75 (0.35-1.64)	0.473

*Contd...*

**Table 2: Contd...**

	Male (%)	Female (%)	RRR (95% CI)*	P
Dissatisfied	14 (3.9)	11 (9.4)	2.51 (1.10-5.73)	0.029
How satisfied are you with your access to health services?				
Satisfied	290 (80.3)	89 (76.1)	1.00	
Fair	49 (13.6)	21 (18.0)	1.37 (0.78-2.42)	0.273
Dissatisfied	22 (6.1)	7 (6.0)	1.04 (0.43-2.51)	0.938
How satisfied are you with your transport?				
Satisfied	332 (92.0)	109 (93.2)	1.00	
Fair	23 (6.4)	7 (6.0)	0.89 (0.37-2.14)	0.792
Dissatisfied	6 (1.7)	1 (0.9)	0.48 (0.06-4.09)	0.506

\*Adjusted for age and specialty. Multinomial regression model was used because the outcome variables are in the categorical form. RRR=Relative risk ratio; CI=Confidence interval; N/A=Not available

**Table 3: Quality of life scores by sex among German emergency physicians**

	Male	Female	$\beta$ (95% CI)*	P
Physical domain				
Raw score	29.2 $\pm$ 3.7	28.5 $\pm$ 4.0	-0.68 (-1.47-0.11)	0.091
Transformed score	79.2 $\pm$ 13.4	76.9 $\pm$ 14.2	-2.35 (-5.19-0.49)	0.104
Psychological domain				
Raw score	23.5 $\pm$ 3.5	22.7 $\pm$ 3.7	-0.82 (-1.56--0.09)	0.029
Age groups				
29-39	23.7 $\pm$ 3.2	22.2 $\pm$ 3.9	-1.48 (-2.54--0.42)	0.006
40-59	23.3 $\pm$ 3.8	23.0 $\pm$ 3.6	-0.35 (-1.43-0.73)	0.528
60-70	23.8 $\pm$ 2.9	24.3 $\pm$ 5.0	1.32 (-2.75-5.39)	0.525
Transformed score	73.1 $\pm$ 14.4	69.4 $\pm$ 15.7	-3.72 (-6.78--0.65)	0.017
Social domain				
Raw score	11.0 $\pm$ 2.5	11.2 $\pm$ 2.5	0.12 (-0.41-0.65)	0.664
Transformed score	67.0 $\pm$ 21.2	68.2 $\pm$ 21.2	1.09 (-3.34-5.52)	0.631
Environmental domain				
Raw score	33.0 $\pm$ 3.6	32.9 $\pm$ 3.6	-0.13 (-0.88-0.62)	0.731
Transformed score	79.9 $\pm$ 11.5	79.3 $\pm$ 11.1	-0.54 (-2.90-1.82)	0.655

\*Adjusted for age and specialty. General linear regression modeling was used because the outcome variables are in the continuous form. CI=Confidence interval

## CONCLUSION

In summary, QOL in German PECPs is satisfactory for the included participants; however, there were some negative effects in the psychological health domain. This is particularly obvious in young female emergency physicians. The results of the present study are consistent with those for resident physicians in the literature; however, the results are limited. Future studies on a national scale and with a longitudinal approach are suggested. In clinical practice, some structural changes in the work pattern and possible interventions such as psychological supports offered for young female PECPs could be considered based on the presented data.

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conducted the study and made substantial contributions to the conception or design of the work. All authors took major roles in the analysis and interpretation of data. All authors were responsible for drafting the work or revising it critically for important intellectual content. All authors approved the present version to be published. I agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

## AUTHORS' CONTRIBUTION

- MS contributed in the conception of the work, acquisition, analysis and interpretation of data, drafting and revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work.

- SH contributed in the conception of the work, drafting and revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work
- FGB contributed in the conception of the work, revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work
- DS contributed in the conception of the work, revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work
- CV contributed in the conception of the work, drafting and revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work
- MB contributed in the conception of the work, drafting and revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work
- ES contributed in the conception of the work, drafting and revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work
- IS contributed in the conception of the work, analysis and interpretation of data, drafting and revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work.

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